Attachment A



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: KLETT, et al.

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| Application No.: | 09/489,640 | Examiner: | Hendrickson, Stuart |
| Date Filed: | January 24, 2000 | Group: | 1754 |

For: PITCH-BASED CARBON FOAM HEAT SINK WITH PHASE CHANGE MATERIAL

CERTIFICATE UNDER 37 CFR 1.8(a)
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450,
on 12/15/03.

Neil R. Jetter Reg. No. 46,803

DECLARATION UNDER 37 C.F.R. §1.132

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Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

I, James W. Klett, declare as follows:

1. I am a named inventor in patent application 09/489,640 entitled " PITCH-BASED CARBON FOAM HEAT SINK WITH PHASE CHANGE MATERIAL." I am currently employed in the Carbon Materials Technology (CMT) Group of the Oak Ridge National Laboratory (ORNL) Metals and Ceramics Division in Oak Ridge, Tennessee.

2. I hold a doctorate in Chemical Engineering from Clemson University which was awarded in 1994. Since 1994, I have worked regularly with carbon foam products and have authored and co-authored numerous publications regarding the same, including:
Klett, James, "High Thermal Conductivity, Pitch-based Carbon Foam for Thermal Management Applications," The 22nd Annual Conference on Ceramic, Metal, and Carbon Composites,

Materials, and Structures, Cocoa Beach, Florida, The Ceramic, Metal and Carbon Composites Committee, 1998.

Klett, James, Tim Burchell, and Jeff Bailey, "Slurry Molded Carbon-Carbon Composites for Thermal Management Applications," The 22nd Annual Conference on Ceramic, Metal, and Carbon Composites, Materials, and Structures, Cocoa Beach, Florida, The Ceramic, Metal and Carbon Composites Committee, 1998.

Klett, James, "High Thermal Conductivity, Mesophase Pitch-Derived Carbon Foam," Proceedings of the 43rd International SAMPE Symposium, May 31-June 4, Anaheim, California, SAMPE, 1998.

Klett, J.W. and T. D. Burchell, "High Thermal Conductivity, Mesophase Pitch-Derived Carbon Foam," Eurocarbon 98: Science and Technology of Carbon, Published French Carbon Group, Strasbourg, France, July 5-9, 1998.

Klett, J. W., V. J. Ervin, and D. D. Edie "Finite Element Modeling of Heat Transfer in Carbon-Carbon Composites," Composites Science and Technology, In Press.

Klett, James, "Thermal Imaging Fingerprint Technology," Proceedings of the Ninth Biometric Consortium Meeting, April 8-9, Crystal City, Virginia, Published Biometric Consortium, 1997.

Klett, J. W. and T. D. Burchell, "High Thermal Conductivity Slurry Molded Carbon-Carbon Composites," Proceedings of the 23nd Biennial Conference on Carbon, Pergamon Press, Penn State University, College Park, PA, July 13-18, 1997.

Besmann, T.M., J. W. Klett, and T. D. Burchell, "Carbon Composite for a PEM Fuel Cell," in Materials for Electrochemical Energy Storage, eds. D. S. Ginley, D. H. Doughty, T. Takamura, Z. Zhang, and B. Scrosati, Vol. 496, Materials Research Society, Warrendale, PA, 1997.

Klett, J. W., T. D. Burchell, and J. L. Bailey, Slurry Molded Carbon-Carbon Composites and Their Applications, 4th International Conference on Composites Engineering, Kona, HI, July 6-12, 1997.

Klett, J. W. and T. D. Burchell, "Carbon Fiber Carbon Composites for Catalyst Supports," Proceedings of the 22nd Biennial Conference on Carbon, Pergamon Press, University of California, San Diego, CA, July 16-21, 1995.

Burchell, T. D., J. W. Klett, and C. E. Weaver, "A Novel Carbon Fiber Based Porous Carbon Monolith," Proceedings of the Ninth Annual Conference on Fossil Energy Materials, Oak Ridge, TN, May 16-18, 1995, CONF-9405204, ORNL/FMP-95/1. pp. 447-456, Pub. Oak Ridge National Lab., Aug. 1995.

Klett, J. W. and D. D. Edie, "Flexible Towpreg for High Thermal Conductivity Carbon/Carbon Composites," Carbon, 33(10), pp. 1485-1503, 1995.

3. I have reviewed the Final Office Action dated October 2, 2003, and the art cited therein.

4. I have reviewed the independent claims which are recited in the present invention.

5. The Reply filed on my behalf dated July 22, 2003 included reasoning regarding why the carbon foam material disclosed by U.S. Patent No. 3,859,421 to Hucke could not have

significant graphite content. The reasoning was based on the Hucke's disclosed Mohs hardness being greater than 7, as compared to the Mohs hardness of graphite being 1 to 2. The Mohs scale runs from 1 to 10, with 10 being the hardest. Thus, the Reply concluded that Hucke's foam having a Mohs' hardness of 7 could not be the claimed "essentially graphitic" foam. However, in the Office Action dated October 2, 2003, the Examiner asserted that essentially graphitic foam of the claimed invention may be the same as that foam disclosed by Hucke based on the following reasoning:

> The [Hucke] carbon foam may be hard due to the oxides used to promote graphitization. Due to the similarity to what is claimed, it appears that the graphite is the same. A showing of the properties resulting from varying the amount of oxide would be appropriate.

6. The oxides referred to by Hucke (col. 29, lines 1-5) are metal oxides (e.g. $TiO_2$, $Cr_2O_3$, etc.) fillers which when mixed in the initial fluid mixture are described as catalyzing the "graphitization reaction." However, following the high temperature "graphitization" step, these metal oxides volatilize, principally into $CO_2$ (gas). Therefore, the metal oxides following "graphitization" are no longer present in a concentration sufficient to significantly affect the mechanical properties of Hucke's final carbon foam material. Therefore, the Mohs hardness of 7 disclosed by Hucke is good evidence of the lack of appreciable graphitic content of Hucke's carbon foam, not the presence of oxides together with an "essentially graphitic material".

7. I further state that all statements made herein are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with my knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application

or any patent issued thereon.

James W. Klett

Dr. James W. Klett

12/15/03

Date